National Institute of Environmental Health Sciences

A case study of avoiding the heat-related mortality impacts of climate change under mitigation scenarios

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Abstract:

We compare heat-related mortality impacts for three European cities, London, Lisbon and Budapest, under five climate change policies representing different dates at which carbon dioxide (CO2) emissions peak, rates at which emissions decline, and emissions floors, and compare them with a non-mitigation business-as-usual emissions scenario, for three time periods, the 2030s, 2050s and 2080s. Under an SRES A1B business-as-usual emissions scenario and using climate projections from 21 GCMs, heat-related mortality rates (per 100,000 of the population) attributable to climate change in the 2080s are simulated to be in the range 2-6 for London, 4-50 for Lisbon and 10-24 for Budapest. Whilst the policy scenarios serve to reduce the number of heat-related deaths attributable to climate change, by up to 70% of the A1B impacts under an aggressive mitigation scenario that gives a 50% chance of avoiding a 2 °C global-mean temperature rise from pre-industrial times, they do not eradicate the effects of climate change on heat-related mortality. The magnitude of avoided impacts is minor in the early 21st century but increases towards the end of the century. Importantly, the magnitude of avoided impacts is more sensitive to the year at which emissions are reduced than to the rate at which emissions are reduced.

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Resource Description

Climate Scenario :

specification of climate scenario (set of assumptions about future states related to climate)

Special Report on Emissions Scenarios (SRES), Other Climate Scenario

Other Climate Scenario: SRES A1B

Early Warning System:

resource focus on systems used to warn populations of high temperatures, extreme weather, or other elements of climate change to prevent harm to health

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Exposure :

weather or climate related pathway by which climate change affects health

Air Pollution, Temperature, Unspecified Exposure

Temperature: Extreme Heat, Fluctuations

Geographic Feature: ☑

resource focuses on specific type of geography

None or Unspecified

Geographic Location: ☑

resource focuses on specific location

Non-United States

Non-United States: Europe

European Region/Country: European Country

Other European Country : England; Portugal; Hungary

Health Impact: ☑

specification of health effect or disease related to climate change exposure

Injury, Other Health Impact

Other Health Impact: heat related mortality

Mitigation/Adaptation: ☑

mitigation or adaptation strategy is a focus of resource

Adaptation, Mitigation

Model/Methodology: ☑

type of model used or methodology development is a focus of resource

Outcome Change Prediction

Resource Type: ☑

format or standard characteristic of resource

Research Article

Timescale: ☑

time period studied

Long-Term (>50 years)

Vulnerability/Impact Assessment: ☑

resource focus on process of identifying, quantifying, and prioritizing vulnerabilities in a system

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